REPORT DOCUMENTATION P

AFRL-SR-BL-TR-98-

0383

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES
	April 22, 1998	Progress Report 6/15/95-9/14/97

4. TITLE AND SUBTITLE
Inference and Modeling for Repairable Systems and Software

5. FUNDING NUMBERS
F49620-94-1-0355

6. AUTHOR(S)
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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
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8. PERFORMING ORGANIZATION REPORT NUMBER
Missouri TR-3

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Air Force Office of Scientific Research/NM
110 Duncan Avenue Suite B115
Bolling AFB, DC 20332-0001

10. SPONSORING/MONITORING AGENCY REPORT NUMBER
AFOSR

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT
Unlimited

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

Three graduate students have been supported by the grant. And Tricia Jones is currently working with the Principal Investigator, Asit Basu, for her Ph.D. degree in statistics. The other two students, Mary Richardson and Larry Ries have completed their dissertations in December, 1995 and 1997. Interesting results on software reliability theory have been obtained. Comparative studies of existing methods are made. Also criteria are being developed as to when a software can be released to the users. Both Bayesian and frequentist approaches are considered.

19980430 122

14. SUBJECT TERMS	15. NUMBER OF PAGES
Statistics, Reliability, Bayesian Methods, Nondestructive Evaluation	3
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRAC
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UL

FINAL TECHNICAL REPORT

FOR THE PERIOD JUNE 15, 1994 TO SEPTEMBER 14, 1997

TO

THE AIR FORCE OFFICE OF SCIENTIFIC REEARCH

ON

INFERENCE AND MODELING FOR REPAIRABLE SYSTEMS AND SOFTWARE
(AIR FORCE GRANT NO. AFOSR F49620-94-1-0355)

BY THE

DEPARTMENT OF STATISTICS
UNIVERSITY OF MISSOURI-COUMBIA

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PROGRESS REPORT ON INFERENCE AND MODELING FOR REPAIRABLE SYSTEMS AND SOFTWARE (GRANT NO. F49620-1-0355)

1. OBJECTIVES: The primary purpose of this project is to provide support and train a graduate student so that he or she can complete a Ph.D. in Statistics.

2. STATUS OF EFFORT: Three students, Larry Ries Mary Richardson and Tricia Jones, have been supported by the Grant. Mr. Larry Ries completed his Ph.D. dissertation in December 1995. Mary Richardson completed her Ph.D. in 1997. Currently Trish Jones is finishing her dissertation.

3. ACCOMPLISHMENTS: Larry Ries obtained some interesting results in the area of software reliability. He has made a comparative study of some existing methods and has also developed criterion as to when a software can be released to the potential users. Tricia Jones, in collaboration with Dr. Barry McKinney of Rome Laboratory, worked on some design problems related to aircraft reliability. Mary Richardson developed some inference procedures related to software reliability models.

4. PERSONNEL SUPPORTED:

Faculty: Asit P. Basu
Graduate Students:

1. Tricia Jones
2. Mary Richardson
3. Larry Ries

5. PUBLICATONS: in peer-reviewed journals and refereed book chapters during the reporting period.

1. Software Reliability: Statistical Modeling, Estimation and Inference. Ph.D. dissertation by Larry Ries (December, 1995).
2. Power Law Process Models for Nonhomogeneous Poisson Process Change-Points. Ph.D. dissertation by Mary Richardson (July, 1997).
3. Effect of Non-normality on Some Design Problems for Improved Reliability Estimates (1997) Proc. Of Physical Science Section, American Statistical Association. Trish Jones and Asit Basu (1996)

6. INTERACTIONS/TRANSITIONS:

6.1 INTERACTIONS

a) The PI is discussing with Dr. Barry McKinney of Rome Laboratory research topics of mutual interest. A graduate student, Tricia Jones, worked on the project initiated by McKinney, as a part of her Ph.D. dissertation.

b) The PI attended the following two Air Force conferences:

1. 3rd Aging aircraft conference at WPAFB, September 1995.

2. 4th Aging aircraft conference at Aif force Academy, July 1996.

The PI explored potential areas of research with the following with a view to developing relevant statistical methods.

a) Dr. Tom Swift, FAA
b) Dr. Walter Jones, AFOSR
c) Mr. Rigo Perez, McDonnel Douglas
d) Mr. Jim Rudd, WPAFB
e) Mr. Claire Paul, WPAFB

6.2 Transitions

NONE

7. PATIENT DISCLOSURES:

None

8. HONORS

Asit P. Basu was elected Fellow of the following societies:

1. American Association for the Advancement of Science, 1987
2. American Statistical Association, 1983
3. Institute of Mathematical Statistics, 1983
4. Royal Statistical Society, England, 1974

and also was elected

5. Member of International Statistical Institute, 1987.

AUGMENTATION AWARDS FOR SCIENCE & ENGINEERING RESEARCH TRAINING (AASERT) REPORTING FORM

The Department of Defense (DoD) requires certain information to evaluate the effectiveness of the AASERT Program. By accepting this Grant which bestows the AASERT funds, the Grantee agrees to provide 1) a brief (not to exceed one page) narrative technical report of the research training activities of the AASERT-funded student(s) and 2) the information requested below. This information should be provided to the Government's technical point of contact by each annual anniversary of the AASERT award date.

1. Grantee identification data: (R&T and Grant numbers found on Page 1 of Grant)

a. University of Missouri-Columbia
University Name

b. AFOSR F49620-94-1-0355
Grant Number

c. _____
R&T Number

d. Asit P. Basu
P.I. Name

e. From: 6/15/96 To: 9/14/97
AASERT Reporting Period

NOTE: Grant to which AASERT award is attached is referred to hereafter as "Parent Agreement".

2. Total funding of the Parent Agreement and the number of full-time equivalent graduate students (FTEGS) supported by the Parent Agreement during the 12-month period prior to the AASERT award date.

a. Funding: $ 28,762

b. Number FTEGS: .22

3. Total funding of the Parent Agreement and the number of FTEGS supported by the Parent Agreement during the current 12-month reporting period.

a. Funding: $ 73,226

b. Number FTEGS: 0

4. Total AASERT funding and the number of FTEGS and undergraduate students (UGS) supported by AASERT funds during the current 12-month reporting period.

a. Funding: $ 24,578

b. Number FTEGS: 1.00

c. Number UGS: 0

VERIFICATION STATEMENT: I hereby verify that all students supported by the AASERT award are U.S. citizens.

Asit P. Basu
Principal Investigator

4/22/98
Date